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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/715,051	11/17/2003	Dennis A. Kramer	60,130-1899;03MRA0388	3671

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EXAMINER

BURCH, MELODY M

ART UNIT	PAPER NUMBER
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3683

DATE MAILED: 12/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/715,051

Applicant(s)

KRAMER, DENNIS A.

Examiner

Melody M. Burch

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 November 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Drawings***

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: reference characters A1 and A2 in figure 6. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Objections***

2. Claims 3-6 and 14-17 are objected to because of the following informalities: in the last line of claim 3, in lines 2 and 3 of claim 4, in line 3 of claim 14, and in lines 2 and 3 of claim 15 "said bearing" should be changed to --said at least one bearing-- to maintain consistency. Appropriate correction is required. The remaining claims are objected to due to their dependency from the above listed objected claims.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-9, 11, 12, 17, and 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re: claim 1. The phrase "actuation mechanism" in line 2 of claim 1 is indefinite. It is unclear to the Examiner as to which elements comprise the actuation mechanism. Examiner would usually consider the pair of pistons to be a part of the actuation mechanism of a disc brake, however, the pair of pistons have been recited in a way suggesting that they are separate from the actuation mechanism. Clarification is required.

Re claim 3. The phrase "a reaction force" in line 3 is indefinite. It is unclear to the Examiner whether the reaction force in claim 3 is intended to be the same or different from that of claim 1. If Applicant intends for the reaction force of claim 3 to be the same as that of claim 1, Examiner recommends such language as --said reaction force--.

Re: claim 8. The phrase "a member which applies said reaction force" in line 2 is indefinite. Applicant recites the member which applies the reaction force as if it were representing an element distinct from the eccentric shaft, however, from the specification it appears that the member which applies the reaction force and the eccentric shaft are the same element. Clarification is required.

Re: claims 8, 11, and 19. The phrase "receives current" in the last line of the claim is indefinite. It is unclear to the Examiner whether Applicant intends for the current in claim 8 to be the same or different from that in claim 1 (or 10).

Re: claim 17. The phrase "said thin anvil member" in lines 1-2 lacks proper antecedent basis in the claim.

Re: claim 18. The phrases "an electric sensor", "a current", and "a resistance" in line 2 from the bottom of claim 18 are indefinite. It is unclear to the Examiner whether the elements are intended to be the same or different from the electric sensor, current, and resistance earlier recited in claim 18.

The remaining claims are indefinite due to their dependency from the above listed rejected claims.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 4784244 to Carre et al.

Carre et al. show in figure 1 a disc brake 2 comprising an actuation mechanism 8,9 being movable to apply a braking force via intervening elements, a pair of pistons one shown at the end of the lead line of number 15 and the other shown surrounding element 29 movable upon receipt of the braking force to force a brake pad shown

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connected to element 4a into contact with an item to be braked, an adjustment mechanism 14,17 for adjusting the location of the pistons to take up clearance with wear in the brake pad, and a force sensor 23 for sensing a reaction force to the braking force, and identifying a point of force application increase indicative of initial contact of the brake pad with the item to be braked, the force sensor sending a signal to an electric control 24 for the adjustment mechanism.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carre et al. in view of US Patent 6272936 to Oreper et al.

Re: claims 7 and 10. Carre et al. describe the invention substantially as set forth above including the limitation of a force sensor, but fail to specifically disclose that the force sensor is an electric sensor receiving a current and having a resistance that varies with the force applied to the force sensor.

Oreper et al. teach the use of a force sensor that is an electric sensor receiving a current and having a resistance that varies with the force applied to the force sensor. See paragraph [0008] of the instant invention.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the force sensor of Carre et al. to have specifically

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been an electric sensor receiving a current and having a resistance that varies with the force applied to the force sensor, as taught by Oreper et al., in order to provide a sensor with optimum sensitivity.

Re: claims 8, 9, 11, and 12. Carre et al. describe the invention substantially as set forth above including the limitation of a force sensor, but fail to specifically disclose that the force sensor includes a protective cover between a member which applies the reaction force and an electric portion of the force sensor which receives current and also fail to disclose the limitation of a relatively thin anvil member placed between the protective cover and the electric portion.

Oreper et al. teach in figures 2 and 8 and in Applicant's admission in paragraph [0008] the limitation of the force sensor including a protective cover between a member which applies the reaction force and an electric portion of the force sensor which receives current and the limitation of a relatively thin anvil member placed between the protective cover and the electric portion.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the structure of the force sensor of Carre et al. to have included a protective cover between the member which applies the reaction force and an electric portion of the force sensor and to have included a thin anvil member between the protective cover and the electric portion, as taught by Oreper et al., in order to provide a means of limiting the amount of force that can be transferred throughout the device to protect the sensor.

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9. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6397977 to Ward in view of Carre et al.

Re: claim 1. Ward shows in figure 1 a disc brake 10 comprising an actuation mechanism described in col. 4 lines 24-28 being movable to apply a braking force via intervening elements, a pair of pistons 24,24 movable upon receipt of the braking force to force a brake pad 26 into contact with an item 1a to be braked, an adjustment mechanism 14,18 for adjusting the location of the pistons to take up clearance with wear in the brake pad, and the presence of a reaction force to the braking force as disclosed in col. 4 lines 40-44.

Ward fails to show the limitation of a force sensor for sensing a reaction force to the braking force, the force sensor sending a signal to an electric control for the adjustment mechanism.

Carre et al. teach in figure 1 the use of a disc brake comprising a force sensor 23 for sensing a reaction force to the braking force and identifying a point of force application increase indicative of initial contact of the brake pad with the item to be braked, the force sensor sending a signal to an electric control 24 for the adjustment mechanism 8 of the disc brake.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the disc brake of Ward to have included a force sensor for sensing a reaction force to the braking force, the force sensor sending a signal to an electric control for the adjustment mechanism, as taught by Carre et al., in



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order to provide more accurate adjustments of the adjustment mechanism for brake control purposes as suggested in Carre et al. col. 4 lines 20-21.

Re: claim 2. Ward, as modified, teaches in figure 1 of Ward the limitation wherein the actuation mechanism is an eccentric shaft 14,18 the eccentric shaft driving at least one bearing 20 to in turn force the pistons and the brake pad toward the item to be braked.

Re: claim 3. Ward, as modified, describes the invention substantially as set forth above, but does not include the limitation wherein the force sensor is located to receive a reaction force from the eccentric shaft and the eccentric shaft applying the reaction force to the bearing.

Carre et al. teach in figure 1 the use of a force sensor 23 being located to receive a reaction force from a shaft 10,11 driving at least one rolling bearing 14 to force the pistons and the brake pad toward an item 1a to be braked.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have positioned a force sensor such that it received a reaction force from the eccentric shaft of Ward, as modified, in view of the teachings of Carre et al., in order to provide a means of detecting the force transmitted by the piston structure on the friction member as taught by Carre et al. in col. 3 lines 15-18.

10. Claims 10-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6397977 to Ward in view of Carre et al. and further in view of Oreper et al.

Re: claims 10-12. Ward shows in figure 1 a disc brake 10 comprising an

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actuation mechanism described in col. 4 lines 24-28 being movable to apply a braking force, a pair of pistons 24,24 movable upon receipt of the braking force to force a brake pad 26 into contact with an item 1a to be braked, an adjustment mechanism 18,14 for adjusting the location of the pistons to take up clearance with wear in the brake pad, and the presence of a reaction force to the braking force as disclosed in col. 4 lines 40-44.

Ward fails to show the limitation of a force sensor for sensing a reaction force to the braking force, the force sensor sending a signal to an electric control for the adjustment mechanism.

Carre et al. teach in figure 1 the use of a disc brake comprising a force sensor 23 for sensing a reaction force to the braking force and identifying a point of force application increase indicative of initial contact of the brake pad with the item to be braked, the force sensor sending a signal to an electric control 24 for the adjustment mechanism 8 of the disc brake.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the disc brake of Ward to have included a force sensor for sensing a reaction force to the braking force, the force sensor sending a signal to an electric control for the adjustment mechanism, as taught by Carre et al., in order to provide more accurate adjustments of the adjustment mechanism for brake control purposes as suggested in Carre et al. col. 4 lines 20-21.

Ward, as modified, is silent as to the makeup of the force sensor specifically being an electric sensor receiving a current and having a resistance that varies with the force applied to the sensor.

Oreper et al. teach in figures 2 and 8 and in Applicant's admission in paragraph [0008] the limitation of the force sensor including a protective cover between a member which applies the reaction force and an electric portion of the force sensor which receives current and the limitation of a relatively thin anvil member placed between the protective cover and the electric portion.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the structure of the force sensor of Ward, as modified, to have included a protective cover between the member which applies the reaction force and an electric portion of the force sensor and to have included a thin anvil member between the protective cover and the electric portion, as taught by Oreper et al., in order to provide a means of limiting the amount of force that can be transferred throughout the device to protect the sensor.

Re: claim 13. Ward, as modified, teaches in figure 1 of Ward the limitation wherein the actuation mechanism is an eccentric shaft 14, 18 the eccentric shaft driving at least one bearing 20 to in turn force the pistons and the brake pad toward the item to be braked.

Re: claim 14. Ward, as modified, describes the invention substantially as set forth above, but does not include the limitation wherein the force sensor is located to

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receive a reaction force from the eccentric shaft and the eccentric shaft applying the reaction force to the bearing.

Carre et al. teach in figure 1 the use of a force sensor 23 being located to receive a reaction force from a shaft 10,11 driving at least one rolling bearing 14 to force the pistons and the brake pad toward an item 1a to be braked.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have positioned a force sensor such that it received a reaction force from the eccentric shaft of Ward, as modified, in view of the teachings of Carre et al., in order to provide a means of detecting the force transmitted by the piston structure on the friction member as taught by Carre et al. in col. 3 lines 15-18.

***Allowable Subject Matter***

11. Claims 4-6 and 17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

12. Claims 15 and 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

13. Claims 18-20 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Ward shows in figure 1 a disc brake having a bearing cup shown under element 14, but does not teach or suggest, alone or as modified, the force sensor being placed on an opposed side of the bearing cup from the surface that supports the bearing and the eccentric shaft.

### ***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patents 5848672 to Brearley et al., 6817452 to Heinlein, 6276494 to Ward et al., and 6129183 to Ward teach similar disc brake structures, US Patents 4606435 to Johnson, 4520661 to Tamai et al., and 6820730 to Angerfors teach the use of disc brakes having force or pressure sensors.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melody M. Burch whose telephone number is 703-306-4618. The examiner can normally be reached on Monday-Friday (7:30 AM-4:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles A. Marmor can be reached on 703-308-0830. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*mmb*  
mmb

December 8, 2004

*Melody M. Bruch*  
12/8/04